

STAR 2006: NOAA Ship *David Starr Jordan* Weekly Science Report

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03 August 2006

Science Summary: 28 July – 2 August 2006

This is the first weekly report of the *David Starr Jordan* STAR 2006 cruise. Our primary mission is to study the status of dolphin stocks in the eastern tropical Pacific (ETP), but we also manage to collect data on oceanography, birds, turtles, squids, flyingfish, plankton, and on a variety of other related projects. It also tends to be social experiment: 14 scientists and 16 officers and crew on a 174' boat for 4 months; always an unpredictable mix of Discovery Channel and Days of Our Lives. Leg 1 on the DSJ is always a reminder for the scientists why we became marine biologists in the first place - we wanted to be professional eco-tourists. The week began with the Baja Blues Festival - dozens of blue whales studded along the continental shelf edge off the Pacific coast of Baja California - a tribute to the amazing success of whale conservation efforts in the eastern north Pacific. It is interesting to consider that we live in an age that celebrates *biodiversity*, whereas *biodensity* tends to get short shrift. Even a casual observer cannot fail to be impressed by a view of 30 blue whales feeding together at the same time, even if they are all the same species.

Our biological event of the week, however, came via visiting scientist Iliana Ruiz-Cooley - she has come to study the ecology of Humboldt squid (*Dosidicus gigas*), which she and her widening band of volunteers catch during our nightly oceanographic stations. She hopes to sample a wide range of sizes, scattered over a wide geographic area. We got the first part done: on one evening last week we used dipnets to catch individuals that were only 1 inch long, and fishing poles to catch other individuals up to 4.5' long. The latter weighed up to 40 lbs. and were as big around as a well-fed thigh. Squids have hard beaks for mincing their prey and they were as large as my fist. We are not accustomed to thinking of squids as threatening animals but a large *Dosidicus* must be one calamitous calamari in its element.

We also cruised by a tiny piece of Mexico this week: Alijos Rocks lies 220 miles off the coast of southern Baja and its rocky stacks jut in to the air like plumbing left over on a spot where an island was swept away. A million years ago Alijos Finches and Alijos Warblers may have evolved on a full-formed Alijos Island but nearly all of the island has since washed into the ocean and now all that is left is three tall tombstones and a few score nesting seabirds. In the past we have seen storm-petrels (tiny, sparrow-sized seabirds) prospecting for nesting crevices at Alijos. They clearly breed there although what species they might be is unknown. There is a good possibility, however, that they could be a remnant population of an unknown species that evolved on the isolated Alijos Island in the long distant past, with its population diminishing over time as its nesting island dissolved into the ocean. We had hoped to collect a single individual to determine what species it is, but the weather was too rough for a small boat launching, and we didn't see any around the rocks any way. But we did take the opportunity to extract several large wahoo from the local waters - it is amazing how blood on the decks can boost morale on this boat. Our Teacher-at-Sea, Mark Harris, also snagged us a red-tailed triggerfish while we were there; it now resides in our outside aquarium. He is a beauty (the fish) and not too fussy about his environs: he was eating chunks of fish moments after we installed him in the tank.

We have a great team of bird and mammal observers this year, all experienced and highly qualified. Our oceanography is up and running almost without a hitch thanks due in large part to having Candy Hall at the helm. Our nightly net tows have not started as yet due to a malfunctioning starboard winch. Kim Belveal, our ET (electronics technician) has been doggedly battling this problem and we hope to be

pestering plankton before too much longer. We have also been having some shaft maintenance problems that have shut down one of our main engines for a couple of days. This means the world passes under our hull at stately 7 kt instead of our usual blistering 10. We hope to have that solved in the next day or so also.

The DSJ crew is, as always, a pleasure to sail with; they know how to have fun and get the job done - we look forward to working with all of them the next 4 months. Our captain is Alex(andra) Von Saunder - female captains are still about as rare as blue whales used to be off California; the world will be a better place when there are lots of both.

Sightings and Effort Summary for Marine Mammals

Date	Start/ Stop Time	Position	Total nm	Average Beaufort
073006	0616/	N30:59.48 W116:43.36	31.3	3.7
	1745	N30:08.48 W116:20.58		
073106	0619/	N28:51.99 W115:57.38	56.7	3.4
	1851	N27:39.29 W115:33.23		
080106	0613/	N26:41.06 W115:11.63	68.8	3.0
	1827	N25:26.18 W114:46.33		
080206	1121/	N24:55.90 W115:46.68	49.0	4.0
	1927	N24:08.62 W116:03.16		

Code	Species	Number of Sightings
013	Stenella coeruleoalba	1
017	Delphinus delphis	14
018	Tursiops truncatus	1
021	Grampus griseus	1
036	Globicephala macrorhynchus	4
037	Orcinus orca	1
046	Physeter macrocephalus	2
063	Berardius bairdii	8
070	Balaenoptera sp.	5
074	Balaenoptera physalus	1
075	Balaenoptera musculus	20
077	unid. Dolphin	3
078	unid. small whale	1
079	unid. large whale	1
098	unid. Whale	1
099	Balaenoptera borealis/edeni	2
Total		66

Photography (Cornelia Oedekoven and Laura Morse)

Species	Common Name	Weekly photographs		Total
		Individuals	Schools	
<i>Balaenoptera musculus</i>	Blue whale	0	8	8
<i>Balaenoptera edeni/borealis</i>	Bryde's/Sei whale	0	2	2
<i>Physeter macrocephalus</i>	Sperm whale	0	2	2
<i>Berardius bairdii</i>	Baird's beaked whale	2	0	2
<i>Grampus griseus</i>	Risso's dolphin	1	0	1
<i>Delphinus delphis</i>	Short-beaked common dolphin	5	0	5
Total		8	12	20

Biopsy (Juan Carlos Salinas and Ernesto Vásquez)

Species	Common Name	Weekly		Total	
		Samples	Takes	Samples	Takes
<i>Balaenoptera musculus</i>	Blue whale	2	4	2	4
<i>Delphinus delphis</i>	Short-beaked common	12	20	12	20
<i>Globicephala</i>	Short-finned pilot whale	5	13	5	13
Total		19	37	19	37

Bird Buzz (Rich Pagen and Chris Cutler)

To begin this series of what are certain to be oh-so incredibly interesting seabird reports, it's with great pleasure that we welcome Chris Cutler to the ranks of seabird observer. To initiate him, the seabirds have provided him with shifts ranging from frantic scanning and continuous entry of data, to shifts where he has had ample time to ponder the meaning of life (or at least to listen to plenty of "Corazon Latino" on the flying bridge stereo).

The waters around Baja California are a hotspot of dark-rumped storm-petrel diversity, giving us good opportunities this week to hone our ID skills. Black, Least, Ashy, and various populations of dark-rumped Leach's Storm-Petrels breed on a number of the islands off Baja. White-rumped species include Galapagos Storm-petrel and white-rumped Leach's Storm-Petrel. The now-extinct Guadalupe Storm-petrel formerly bred on Guadalupe Island, it also had a white rump, but we are about 100 yrs too late to see that one.

At Alijos Rocks, we encountered our trip's first Masked and Brown Boobies, Magnificent Frigatebirds and Sooty Terns. While scanning the island through the "big eyes," our keen-eyed oceanographer Candy Hall spotted a Brown Pelican, the first record of this species from Alijos Rocks and a long way offshore for this coastal species.

The last few days of the week were in "quieter" offshore waters. The occasional Leach's Storm-Petrel (white-rumped) and Cook's Petrel kept things interesting. And when a Brown Booby began hunting flyingfish off our bow, we were instantly reminded of what lies ahead as we make our way south into the core of the eastern tropical Pacific.

Turtle Operations (Lindsey Peavey, et al.)

On Sunday, 30 July, we saw our very first turtle of STAR 2006 - a juvenile loggerhead bobbing at the surface on our port side; it is striking amber and brown shell all wet and shiny. On 1 August, the small boat captured two juvenile loggerheads and brought them to the ship for processing. The turtles are weighed, measured, blood and skin tissue samples collected, and tagged on the two rear flippers with metal tags reading unique numbers. Two tags increase the chances that at least one will be retained. Recaptured turtles can help us better understand growth rates and movements. The two beautiful and healthy turtles were released about 20 minutes after capture. Next week we are expecting many more turtles as we head into the coastal waters of Baja California Sur. We should be just off Magdalena Bay on Friday, which some believe is the 'loggerhead capital' of Mexico! Stay tuned!

Species	Common name	Number sampled	
		Weekly	Total
<i>Caretta caretta</i>	Loggerhead	2	2
<i>Lepidochelys olivacea</i>	Olive ridley	0	0
Total		2	2

Squid Ops (Iliana Ruiz-Cooley)

During our nightly CTD and net tow stations when we stop the engines for two hours, we have been observing small size squids swimming at the sea surface since the first day of the cruise. On 30 July, we started our jigging effort and caught our first Humboldt squid (*Dosidicus gigas*). We collected three tiny squids using the dipnets, including one *Onychoteuthis sp.* The inch-long specimen was one mean little squid; it bit me so hard with its beak (mandibles) that it left a red mark on my hand that I still have four days later. Well, it fought for survival until the end...fair enough.

On 31 July, we had a very exciting day. During the first 10 minutes of jigging, we caught medium size squids (20 to 35 cm mantle length), but unexpectedly, we also caught very large size squids using larger jigs. Some of them reached 1.5 m in total length (from the arm to the tip of the mantle)...almost my size, but I am still 5 cm larger! Landing the squids was not easy, they fought hard, and we needed to use a boat hook to pull them onboard. There was a lot of excitement and commotion: several scientists, crew members, and the captain caught their first giant Humboldt squids ever. Other scientists were taking pictures and video. Potentially, these may be the largest squids ever caught in the northeastern Pacific - this is pending confirmation. We also saw a pair of squid suspended at the sea surface, locked in embrace, and possibly mating. That night we were up until 2 am weighing and collecting squid tissue samples. It was hard work and a collaborative effort thanks to the participation of everybody!

We will continue observing small size squids at the sea surface, and hopefully we will encounter more giant Humboldt squid near the southern tip of the Baja California peninsula. Keep a giant squid eye out for our photos on the website!

Fish Sampled for Diet and Isotope Analysis

Species	Samples	
	Weekly	Total
Yellowfin tuna	4	4
Skipjack	5	5
Wahoo	2	2
Mahi Mahi	5	5
Total	16	16

Oceanographic Operations (Candy Hall)

Our epic adventure in the eastern tropical Pacific started off famously on Friday with a successful EK500 acoustic transducer calibration by Dave Demer and his team, and rather dare-devil small boat handling training for the rest of us. Saturday morning found many of us surgically attached to our cell phones as we bid a fond farewell to our hot and humid homeport, San Diego. Finally, we had embarked upon our 4-month journey across more nautical miles than many of us could actually fathom, only to spend Day 1 just outside of San Diego Harbor. Hours flew as all personnel impressed the NOAA Fleet Safety Inspectors with the DSJ's ability to respond swiftly to emergency situations. Who else would any sane CO want aboard during a 'man-over-board' drill but this crew of observers? We did manage to squeeze in a test CTD (conductivity, temperature, & depth) cast that night so at least the CTD team of Mark Harris (Teacher-at-sea) and I did some scheduled work that day!

The rest of the week has continued in the same, structured vein and we are in full operational swing. Turtle-girl, Lindsey Peavey, wears the oceanography hat for the noon and 1500h surface chlorophyll and XBT stations, allowing me time to minimize my wide-eyed squid-caught-in-the-decklamps look.

Date	CTD	XBT	Bongo tow	Manta tow
29 July*	1	0	0	0
30 July	2	3	0	0
31 July	2	3	0	0
1 Aug	2	3	0	0
2 Aug	2	3	0	0
Total	9	12	0	0

* CTD cast on 29 July was a test